

ABSTRACT OF THE DISCLOSURE

A semiconductor wafer is held by support pins horizontally. A susceptor and a heating plate are moved upwardly so that the semiconductor wafer is transferred from the support pins to the susceptor. At this time, a gas layer is sandwiched between the upper surface of the susceptor and the lower surface of the semiconductor wafer to cause the semiconductor wafer to float over the upper surface of the susceptor for about seventy seconds immediately after the semiconductor wafer is mounted on the upper surface of the susceptor. Then, flash lamps are lit up to perform flash heating while the semiconductor wafer is floating over the upper surface of the susceptor. Even when flashlight irradiation causes rapid thermal expansion of the wafer surface, the semiconductor wafer does not suffer a great stress. This can prevent the semiconductor wafer from breaking.